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Information Processes in Optical Echo Holography

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Abstract

A set-theoretical method for studying information processes in resonant media with phase memory is developed. The conversion of the classical information carried by the object laser pulse into the potential (structural) quantum information of the resonant medium that takes place during the recording of a phase echo hologram is studied. It is shown that a resonant medium with phase memory stores quantum information in the form of an information-phase grating (the distribution of qubits within the inhomogeneously broadened line of a resonant transition). The temporal evolution of this grating is studied as a function of the times of reversible and irreversible relaxation of the system. © 2007 MAIK "Nauka/Interperiodica".

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